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Title: Justification of a Simple Ramsauer Model for Neutron Total Cross Sections.*

Abstract:
The simple nuclear Ramsauer model had been used successfully to fit neutron total cross sections for over three decades, but has not been widely used because the foundations of the model seem so unrealistic. We show that Glauber calculations, with the inclusion of refraction, and optical model calculations essentially validate the use of this simple nuclear Ramsauer model for neutron total cross sections in the neutron energy region of 5-50 MeV. This model yields a simple formula for parameterizing the energy dependence of the neutron total cross section. We have applied this model to nuclei ranging from vanadium to bismuth. Using the simplest parameterization we obtained fits to the data to within 2.5%. With the addition of a single parameter we can improve these fits to less that 1%.

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